ULTRAVIOLET LASER SYSTEM AND METHOD FOR FORMING VIAS IN MULTI-LAYERED TARGETS

Abstract of the Disclosure

The output of a continuously pumped, Q-switched, Nd:YAG laser (10) is frequency converted to provide ultraviolet light (62) for forming vias (72, 74) in multi-layered targets (40). The parameters of the output pulses (62) are selected to facilitate substantially clean, simultaneous or sequential drilling or via formation in a wide variety of materials such as metals, organic dielectrics, and reinforcement materials having different thermal absorption characteristics in response to ultraviolet light. These parameters typically include at least two of the following criteria: high average power of greater than about 100 milliwatts measured over the beam spot area, a temporal pulse width shorter than about 100 nanoseconds, a spot diameter of less than about 50 microns, and a repetition rate of greater than about one kilohertz. The laser system (10) and method circumvent conventional depth of cut saturation limitations and can achieve an increased depth of cut per pulse in a target (40) formed of either single- or multi-layered material.